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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,872	09/29/2003	Robert F. Bartfai	TUC920030099US1	6313

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EXAMINER	
RIAD, AMINE	

ART UNIT	PAPER NUMBER
2113	

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/674,872	BARTFAI ET AL.	
	Examiner	Art Unit	
	Amine Riad	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-30 have been presented for examination.

Claims 1-30 have been rejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6, 12-16, 20, and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Crockett US Patent 5,504,861.

In regard to claims 1, 12, and 20

Crockett discloses a method of recovery from a data storage system failure in a data storage system having a host computer (Figure 4; item 401) writing updates (Column 2;lines 59-61) to a local storage controller (Figure 4; item 405) associated with a local storage device at a local site (Figure 4; item 406), the local storage controller asynchronously copying the updates (Column 2; lines 64-66) to a remote storage controller at a remote site (Figure 4; item 431) the remote storage controller storing the updates on a remote storage device (Column 2; line 64 [asynchronously shadowing record updates from a primary site to a secondary site is interpreted as storing the updates in the secondary site]) and periodically storing a consistent point in time copy of the updates on a backup storage device (Column 3; line 1-9) and (Figure 4; item 417), the method comprising:

- Detecting a failure associated with the local site; (Column 3; line 15-17 [running disaster recovery for primary system inherently suggests that a failure was detected at the primary site])

- Determining whether a consistent point in time copy of the updates pending for storage on the backup storage device at the time the failure is detected form an intact consistency group; (Column 3; lines 4-6)

- Correcting the failure associated with the local site;(Column 3; line 15-17 [secondary system provides disaster recovery for primary is interpreted as correcting the failure associated with the first site])

- Copying changed data from the remote storage device to the local storage device to resynchronize the local storage device with the remote storage device. (Figure 10; item 1085 [requesting primary site to resend missing records makes the primary site synchronized with the secondary storage])

In regard to claims 3, 13, and 22

Crockett discloses the method of claim 1 comprising taking corrective action on the updates pending for storage on the backup device to create an intact consistency group.(Column 15; lines 53-58 [picking the consistency group with the earliest time stamp is interpreted as a corrective action on the pending updates]) and (Figure 11; item)

In regard to claims 4, 14, and 23

Crockett discloses the method of claim 3 in which the corrective action taken is selected from a group of actions consisting of:

- Completing a pending consistency group,(Column 15; lines 48-51)
- withdrawing the pending consistency group, (Column 15; lines 44-47)
- reverting to a prior intact consistency group and allowing the pending consistency group to become the intact consistency group.(Column 15; lines 54-58)

In regard to claims 5, 15, and 24

Crockett discloses the method of claim 4 further comprising physically copying to the backup storage device the updates in the intact consistency group, thereby forming a recovery consistency group. (Column 15; lines 37- 41)

In regard to claims 6, and 25

Crockett discloses the method of claim 5 further comprising synchronizing the updates stored on the remote storage device with the updates of the recovery consistency group.(Figure 15; Item 1520) and (Column 17; lines 21-22)

In regard to claim 16

Crockett discloses that the system for copying stored data of claim 15 comprises a remote host. (Figure 1; item 5)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett US Patent 5,504,861 in view of Gagne US Patent 6,742,138.

In regard to claims 2, and 21

Crockett discloses a method of recovery from a data storage system as recited in parent claims 1 and 20, which upon detecting failure associated with the local site:

- Quiescent the host computer. (Column 8; line 2)

Crockett does not disclose:

- Terminating the asynchronous copying of updates from the local storage controller to the remote storage controller;
- Establishing a reverse asynchronous update copying relationship from the remote storage controller to the local storage controller;

Gagne teaches

- Terminating the asynchronous copying of updates from the local storage controller to the remote storage controller;(Column 2;line 50-51)
- Establishing a reverse asynchronous update copying relationship from the remote storage controller to the local storage controller;(Column 2;line 52-56)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of terminating copying of updates from local storage controller to remote storage controller, and establishing a reverse copying from a remote storage controller to a local storage controller of Gagne into the method of recovery from a data storage failure of Crockett.

One of ordinary skill in the art at the time the invention was made would have been motivated to make the combination because as disclosed by Gagne data recovery can be time consuming especially if the data is saved in a tape back up made earlier in time.

Claims 7, 8,17, 26,and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett US patent 5,504,861 in view of Beardsley US Patent 6,304,980.

In regard to claims 7, and 26

Crockett discloses a method of recovery from a data storage system as recited in parent claims 1, and 20.

Crockett does not disclose writing post failure updates directly to the remote storage.

Beardsley teaches that updates are written directly to the remote storage (Column 4; line 40-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of writing updates directly to the remote storage controller of Beardsley into the method of recovery from a data storage failure of Crockett. One of ordinary skill in the art at the time the invention was made would have

been motivated to make the combination because it guarantees the integrity of the updates.

In regard to claims 8, 17 and 27

Crockett discloses a method of recovery from a data storage system as recited in parent claims 1, and 20.

Crockett does not disclose writing post failure updates directly to the remote storage from a remote host.

Beardsley teaches that updates are written directly to the remote storage from a remote host (Column 4; line 40-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of writing updates directly to the remote storage controller of Beardsley into the method of recovery from a data storage failure of Crockett. One of ordinary skill in the art at the time the invention was made would have been motivated to make the combination because it guarantees the integrity of the updates.

Claims 10, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett US patent 5,504,861 in view of Beardsley US Patent 6,304,980, and further in view of Gagne US Patent 6,742,138.

Regarding claims 10, and 29

Crockett/Beardsley disclose quiescing the recovery host (Column 8; line 2 [by quiescing the primary processor the host is quiesced in turn also])

Crockett/Beardsley do not disclose

- Terminating the asynchronous copying of updates from the remote storage controller to the local storage controller;
- Re-establishing the asynchronous copy relationship from the local storage controller to the remote storage
- Storing a new consistent copy of the data on the remote storage device to the back up storage device.

Gagne in (Column 4 & 5; lines 61-67 and lines 1-4) teaches when the recovery procedure has been completed successfully; it is possible to renew writing operations to the BCV, which is considered the remote storage unit. He also teaches that once this step is finished it is followed by data synchronization of the BVC with the STD. In order for these steps to be accomplished the steps of terminating the copying from remote to local, re-establishing the copying from local to remote, and storing the new consistent copy of data on the remote storage would have to happen.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of terminating copying of updates from remote storage controller to local storage controller, and re-establishing a reverse copying from local storage controller to remote storage controller of Gagne into the method of recovery from a data storage failure of Crockett.

One of ordinary skill in the art at the time the invention was made would have been motivated to make the combination because as disclosed by Gagne data recovery can be time consuming especially if the data is saved in a tape back up made earlier in time, in addition to keeping the recovery system up to date.

Claims 9, 18, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett US Patent 5,504,861 in view of Beardsley 6,304,980, and further in view of Crockett US Patent 6,772,303.

Crockett 861/Beardsley disclose a method of recovery from a data storage system as recited in parent claims 1, 12, and 20.

In regard to claims 9, 18, and 28

Crockett 861/Beardsley do not disclose synchronizing the local storage device with the recovery consistency group and the post failure updates by the asynchronous copying of updates from the recovery storage controller to the local recovery controller.

Crockett 303 teaches synchronizing the local storage device with the recovery consistency group and the post failure updates by the asynchronous copying of updates from the recovery storage controller to the local recovery controller. (Column 3; line 20-25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of synchronizing the local storage device with the recovery consistency group and post failure updates by copying updates from the

recovery storage to the local recovery controller of Crockett 303 into the method of recovery from a data storage failure of Crockett 861.

One of ordinary skill in the art at the time the invention was made would have been motivated to make the combination because it makes the recovery system current with the updates, and therefore ready for the next failure in case it happens.

Claim 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett US Patent 5,504,861 in view of Beardsley 6,304,980, and further in view of "Efficient Management of Remote Disk Subsystem Data Duplexing" referred to hereinafter as IBM.

Crockett/Beardsley disclose a method of recovery from a data storage system as recited in parent claim 12.

Crockett/Beardsley do not disclose merging updates written to the remote storage volume with the recovery consistency group on the back up storage.

IBM teaches disclose merging updates written to the remote storage volume with the recovery consistency group on the back up storage (Page 3; Paragraph 4; "the serializer can read the previous buffers from all the control unit to be merged into a complete consistency group").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of merging updates written to the remote storage volume with the recovery consistency group on the back up storage into the method of recovery from a data storage failure of Crockett.

One of ordinary skill in the art at the time the invention was made would have been motivated to make the combination because it makes the recovery system current with the updates, and therefore ready for the next failure in case it happens.

Claims 11, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett US Patent 5,504,861 in view of Beardsley 6,304,980, and Gagne US Patent 6,742,138, and further in view of IBM.

In regard to claim 11, and 30

Crockett/Beardsley/Gagne disclose a method of recovery from a data storage system as recited in parent claims 1 and 20.

Crockett/Beardsley/Gagne do not disclose merging updates written to the remote storage volume with the recovery consistency group on the back up storage.

IBM teaches disclose merging updates written to the remote storage volume with the recovery consistency group on the back up storage (Page 3; Paragraph 4; "the serializer can read the previous buffers from all the control unit to be merged into a complete consistency group").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of merging updates written to the remote storage volume with the recovery consistency group on the back up storage into the method of recovery from a data storage failure of Crockett.

One of ordinary skill in the art at the time the invention was made would have been motivated to make the combination because it makes the recovery system current with the updates, and therefore ready for the next failure in case it happens.

Response to Applicant's Argument

Applicant arguments filed on August 2, 2006 have been fully considered, and are not persuasive.

In regard to the argument in which the Applicant states, "Crockett 861 does not address the issue of a failure in the primary site. Thus, Crockett 861 does not, as asserted in the Office Action, disclose the claimed "re-synchronizing the local [primary] storage device"" Examiner respectfully disagrees. Examiner points out that the summary of the invention discloses, "The secondary site includes secondary storage devices disaster recovery capabilities for the primary site" Examiner considers that when Crockett discloses that the secondary storage devices include disaster recovery capabilities for the primary site, Crockett clearly addresses the issue of failure in the primary site. Additionally, Crockett discloses that " A primary data mover collects sets of record updates and corresponding record set information into self describing record set, the self describing record sets further being assembled into ..wherein each record is ordered according to a primary system synchronized time stamp." In this passage Crockett discloses the issue of re-synchronizing the primary system. Consequently, Applicant argument is invalid, and does not stand on solid ground.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amine Riad whose telephone number is 571-272-8185. The examiner can normally be reached on 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on 571-272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AR
Amine Riad
Patent Examiner
9/27/2006

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